IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Currently Amended) A method of determining physical, chemical and/or biological state variables in an examination area of an examination object by determining a change in a spatial distribution of magnetic particles in the examination area, the method comprising the acts of:

introducing into the examination area magnetic particles in a first state or in a second state wherein, in the first state, at least some of the magnetic particles that are to be examined are agglomerated and/or coupled to one another and wherein, in the second state, the particles are deagglomerated and/or decoupled;

generating a magnetic field having a strength with a spatial profile such that there is produced in the examination area two part-areas including a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength than the low magnetic field strength;

changing spatial positions of the two part-areas in the examination area or changing the magnetic field strength in the first part-area to cause the change in the spatial

distribution of magnetic particles so that magnetization of the particles is locally changed;

detecting signals that depend on the magnetization in the examination area that is influenced by the changing act;

evaluating the signals so as to obtain information about the change in the spatial distribution of the magnetic particles and about physical, chemical and/or biological state variables, wherein the physical, chemical and/or biological state variables include at least one of substance concentration, temperature, pressure, viscosity and pH; and

correlating the change in the spatial distribution of the magnetic particles in the examination area with at least one of a local concentration, temperature, pressure, viscosity and pH value to determine the at least one of the local substance concentration, temperature, pressure, viscosity and pH; and

providing an indication of the determined at least one of the local substance concentration, temperature, pressure, viscosity and pH.

2.(Previously Presented) The method as claimed in claim 1, wherein the detecting act includes detecting change of the magnetic particles from the first state to the second state including deagglomeration and/or decoupling of coupled individual magnetic particles and/or detecting increased distance between individual magnetic particles.

3.(Previously Presented) The method as claimed in claim 1, wherein the detecting act includes detecting passage of the magnetic particles between the first state and the

second state, the passage being due to at least one of heat, radiation, acid, base, electrical or magnetic fields, ultrasound and/ an enzyme.

Claim 4 (Canceled)

5.(Previously Presented) The method as claimed in claim 1, further comprising the act of spatially delimiting the agglomerated magnetic particles in a medium which can be physically, chemically and/or biologically modified, dissolved and/or degraded.

6.(Previously Presented) The method as claimed in claim 5, wherein the medium comprises polysaccharides, starch, in particular dextrins or cyclodextrins, waxes, oils, fats or gels.

7.(Previously Presented) The method as claimed in claim 5, the medium comprises microorganisms.

8.(Previously Presented) The method as claimed in claim 1, further comprising the act of providing the agglomerated magnetic particles on a surface of a particulate.

9.(Previously Presented) The method as claimed in claim 1, further comprising the act saturating the magnetic particles by application of an external magnetic field having a

strength of about 100 mT or less.

10.(Currently Amended) The method as claimed in claim 1, wherein the magnetic

particles comprise multidomain or monodomain particles, and further comprising the act of

reversing the magnetization of the multidomain or monodomain particles by Neel's rotation

and/ Brown's rotation.

11.(Previously Presented) The method as claimed in claim 1, wherein the magnetic

particles are hard-magnetic or soft-magnetic multidomain particles.

12.(Previously Presented) The method as claimed in claim 1, wherein the magnetic

particles are monodomain particles, or soft-magnetic multidomain particles of asymmetric

shape, the method further comprising the act of reversing the magnetization of the

monodomain particles by Neel's and Brown's rotation.

13.(Currently Amended) The method as claimed in claim 1, further comprising the

acts of:

binding the magnetic particles to functional binding units including at least one of a

functional group, a DNA sequence, an RNA sequence, and an aptamer, and ; and

introducing into the examination area at least one compound which has

complementary functional binding units including at least one of a complementary

functional group, a complementary DNA sequence, a complementary RNA sequence, and

a complementary aptamer sequence, that interacts in a binding manner with at least one

functional binding unit of the magnetic particles.

14.(Currently Amended) ~~the~~ The method as claimed in claim 1, wherein evaluating

act further comprises the acts of:

selecting of a path for the movement of the first part-area having a low magnetic field

strength within the examination area,

recording of reference data by using reference samples along the path at at least

one location, and in the case of at least two locations, recording external parameters using

at least a first receiving coil,

at least one of interpolating and extrapolating the recorded reference data recorded

in respect of points and external parameters not recorded,

measuring the path within the examination area in a sequence that is substantially

identical to that used for the recording of data by the reference samples via a coil

arrangement including at least one of the first receiving coil and a second receiving coil,

and

comparing the measured data with the reference data by an error square

minimization to obtain compared data.

15.(Previously Presented) The method as claimed in claim 14, further comprising

the act of converting the reference data to characteristics of at least a second receiving coil used for the measuring act.

16.(Previously Presented) The method as claimed in claim 14, further comprising the act of assigning the compared data obtained by the comparing act to a gray value for a pixel to give an image, with the relative pixel intensity representing a degree of the external parameters determined by at least one of the recording act and the at least one of interpolating and extrapolating acts.

17.(Currently Amended) The method as claimed in claim 16, ~~further comprising~~ wherein the providing act includes the act of displaying the image in a merged image.

Claim 18 (Canceled)

19.(Previously Presented) The method as claimed in claim 14, further comprising one of the acts of:

moving the first part-area having the low magnetic field strength by actuating and/or moving the coil arrangement ;

keeping stationary the first part-area having the low magnetic field strength while moving the examination object ; and

moving simultaneously both the examination object and the first part-area relative to

one another.

Claims 20-40 (Canceled)

41.(Previously Presented) The method of claim 1, wherein the act of changing the magnetic field strength changes the magnetic field strength temporally in a first frequency band, and the detecting act includes detecting the signal in a second frequency band, the second frequency band including harmonics of signals in the first frequency band.

42.(Previously Presented) The method of claim 1, wherein the act of generating the magnetic field includes the act of first and second magnetic fields which change at different rates and with different amplitudes, wherein the first magnetic field changes slowly in time and with a higher amplitude relative the second magnetic field, and the second magnetic field changes rapidly in time terms and with a lower amplitude relative the first magnetic field.

43.(New) The method of claim 1, wherein the detecting act includes detecting changes in magnetic properties of the magnetic particles due to changed distances between the magnetic particles; the method further comprising the act of producing a contrast in an image of the spatial distribution of the magnetic particles in the examination area based on the detected changes in the magnetic properties.